

***In the Claims***

The status of claims in the case is as follows:

1        1.     [Currently amended] Method for nesting IP Sec-based  
2        VPN connections between a plurality of nodes in a  
3        communication network in which nested connections establish  
4        a tunnel within a tunnel including an inner connection and  
5        an outer connection having at least one coincident endpoint  
6        residing on a same node, comprising the steps of:

7                receiving at a first node ~~on an~~ on said outer  
8                connection a request from a second node to establish a  
9                coincident endpoint for nesting ~~an inner~~ a secure inner  
10               connection within said outer connection;

11               negotiating over said outer connection parameters  
12               defining said inner connection and resulting from  
13               Internet key exchange (IKE) negotiations for  
14               establishing an agreed upon encryption algorithm and  
15               key generation; and thereafter

16               responsive to communication occurring on said inner  
17               connection, at said first node linking said inner

END920000092US1

2 of 34

S/N 09/813,911

18        connection to said outer connection for selectively  
19        receiving [[or]] and sending said communication double  
20        nested on said outer connection to allow subsequent  
21        traffic to be correctly processed by said inner  
22        connection, then by said outer connection, at both ends  
23        of both connections and thereby enabling outbound  
24        traffic between respective nodes selectively to flow  
25        inside said outer tunnel and not said inner tunnel, in  
26        said inner tunnel and said outer tunnel, and in neither  
27        tunnel.

1        2.     [Canceled]

1        3.     [Canceled]

1        4.     [Currently amended] The method of ~~claim 3~~ claim 1,  
2        further comprising the step of using Layer 2 Tunnel Protocol  
3        (L2TP) to tunnel packets across said communication network.

1        5.     [Currently amended] Method for operating an enterprise

END920000092US1

3 of 34

S/N 09/813,911

2     gateway node to a plurality of nodes in a communication  
3     network in which nested connections establish an inner  
4     tunnel within an outer tunnel including an inner connection  
5     and an outer connection having at least one coincident  
6     endpoint residing on a said gateway node, comprising the  
7     steps of:

8             receiving at said gateway node from a remote client  
9             node a request to establish an outer connection;

10            receiving at said gateway over said outer connection a  
11            request to establish, and thereupon negotiating  
12            parameters establishing, a secure inner connection  
13            using Internet key exchange (IKE) negotiations for  
14            establishing an agreed upon encryption algorithm and  
15            key generation and further including establishing a  
16            local coincident endpoint of said inner and outer  
17            connections at said gateway;

18            responsive to outbound or inbound traffic on said inner  
19            connection, establishing links to said outer connection  
20            for communicating said traffic double nested on said  
21            outer connection to allow subsequent traffic to be  
22            correctly processed by said inner connection, then by

END920000092US1

4 of 34

S/N 09/813,911

23        said outer connection, at both ends of both connections  
24        and thereby enabling outbound traffic between  
25        respective nodes selectively to flow inside said outer  
26        tunnel and not said inner tunnel, in said inner tunnel  
27        and said outer tunnel, and in neither tunnel.

28        6.    [Canceled]

1        7.    [Original] The method of claim 5, further comprising  
2        the step of:

3           tunneling packets across said communication network  
4           using Layer 2 Tunnel Protocol (L2TP).

1        8.    [Currently amended] A method for operating a first one  
2        of a plurality of nodes in a communications network in which  
3        nested connections establish an inner tunnel within an outer  
4        tunnel including an inner connection and an outer connection  
5        having at least one coincident endpoint residing on said  
6        first node, comprising the steps of:

END920000092US1

5 of 34

S/N 09/813,911

7 establishing at said first node a coincident endpoint  
8 for an outer connection and an inner connection with at  
9 least one second node in said network for setting up a  
10 tunnel within a tunnel between said first and second  
11 nodes and executing Internet key exchange (IKE)  
12 negotiations for establishing an agreed upon encryption  
13 algorithm and key generation;

14 responsive to starting communication of traffic over  
15 said connections, establishing a link from said inner  
16 connection to said outer connection including  
17 establishing a local coincident endpoint of said inner  
18 and outer connections at said first node; and

19 responsive to said links, selectively encapsulating  
20 said traffic to said outer connection for transfer to  
21 said second node [[or]] and decapsulating said traffic  
22 from said outer connection followed by decapsulating  
23 said traffic from said inner connection for receipt at  
24 said first node.

1 9. [Original] The method of claim 8, said inner  
2 connection being a secure connection.

END920000092US1

6 of 34

S/N 09/813,911

1        10. [Original] The method of claim 8, further comprising  
2        the step of:

3                tunneling packets across said communication network  
4                using Layer 2 Tunnel Protocol (L2TP).

1        11. [Currently amended] Method for nesting connections in  
2        a tunnel within a tunnel having at least one coincident  
3        endpoint between a plurality of nodes in a communication  
4        network, said nodes including a client, ~~and internet~~ an  
5        Internet service provider (ISP), an enterprise gateway, and  
6        an internal network, comprising the steps of:

7                operating said client node to call said ISP node;

8                operating said ISP node to start an outer connection  
9                with respect to said gateway node and to return an IP  
10               address to said client node;

11               operating said client node to send to said gateway node  
12               over said outer connection a request to establish a

END920000092US1

7 of 34

S/N 09/813,911

13           secure nested inner connection;

14           operating said client node and said gateway node to  
15           negotiate over said outer connection parameters  
16           defining said secure nested inner connection resulting  
17           from Internet key exchange (IKE) negotiations for  
18           establishing an agreed upon encryption algorithm and  
19           key generation, and saving said parameters at said  
20           gateway node; and thereafter

21           operating said client node to start said inner  
22           connection;

23           operating said ISP node to decapsulate said outer  
24           connection;

25           operating said client node to decapsulate said inner  
26           connection; and

27           operating said gateway node to recognize the start of  
28           said inner connection and to link said inner connection  
29           to said outer connection to allow subsequent traffic to  
30           be correctly processed by said inner connection, then  
31           by said outer connection, at both ends of both

END920000092US1

8 of 34

S/N 09/813,911

32           connections, and sending outbound traffic in said inner  
33           connection double nested in said outer connection.

1           12.   [Canceled]

          13.   [Canceled]

1           14.   [Original]   The method of claim 13, further comprising  
2           the step of:

3           tunneling packets across said communication network  
4           using Layer 2 Tunnel Protocol (L2TP).

1           15.   [Currently amended]   System for nesting connections  
2           between a plurality of nodes in a communication network in  
3           which nested connections establish a tunnel within a tunnel  
4           including an inner connection and an outer connection having  
5           at least one coincident endpoint residing on a same node,  
6           comprising:

END920000092US1

9 of 34

S/N 09/813,911



7 a first node on an outer connection for receiving a  
8 request from a second node to establish a coincident  
9 endpoint for nesting an inner connection within said  
10 outer connection including executing Internet key  
11 exchange (IKE) negotiations for establishing an agreed  
12 upon encryption algorithm and key generation;

13 said first and second nodes negotiating over said outer  
14 connection parameters defining said inner connection;  
15 and thereafter

16 said first node being responsive to communication  
17 occurring on said inner connection for linking to said  
18 outer connection for selectively receiving or sending  
19 said communication double nested on said outer  
20 connection to allow subsequent traffic to be correctly  
21 processed by said inner connection, then by said outer  
22 connection, at both ends of both connections;

23 thereby enabling outbound traffic between respective  
24 nodes selectively to flow inside said outer tunnel and  
25 not said inner tunnel, in said inner tunnel and said  
26 outer tunnel, and in neither tunnel.

END920000092US1

10 of 34

S/N 09/813,911

1 16. [Original] The system of claim 15, said inner  
2 connection being a secure connection.

1 17. [Original] The system of claim 16, said inner  
2 connection being an IPsec connection.

1 18. [Original] The system of claim 17, further comprising  
2 a Layer 2 Tunnel Protocol (L2TP) connection for tunneling  
3 packets across said communication network.

1 19. [Currently amended] A program storage device readable  
2 by a machine, tangibly embodying a program of instructions  
3 executable by a machine to perform method steps for nesting  
4 connections between a plurality of nodes in a communication  
5 network in which nested connections establish a tunnel  
6 within a tunnel including an inner connection and an outer  
7 connection having at least one coincident endpoint residing  
8 on a same node, said method steps comprising:

9 receiving at a first node on an outer connection a  
10 request from a second node to establish a coincident

END920000092US1

11 of 34

S/N 09/813,911

11 endpoint for nesting an inner connection within said  
12 outer connection;

13 negotiating over said outer connection parameters  
14 defining said inner connection resulting from Internet  
15 key exchange (IKE) negotiations for establishing an  
16 agreed upon encryption algorithm and key generation;  
17 and thereafter

18 responsive to communication occurring on said inner  
19 connection, at said first node linking to said outer  
20 connection for selectively receiving or sending said  
21 communication double nested on said outer connection to  
22 allow subsequent traffic to be correctly processed by  
23 said inner connection, then by said outer connection,  
24 at both ends of both connections.

1 20. [Currently amended] A program storage device readable  
2 by a machine, tangibly embodying a program of instructions  
3 executable by a machine to perform method steps for  
4 operating an enterprise gateway in a communications network  
5 in which nested connections establish a tunnel within a  
6 tunnel including an inner connection and an outer connection

END920000092US1

12 of 34

S/N 09/813,911

7     having at least one coincident endpoint residing on a same  
8     node, said method steps comprising:

9             receiving at said gateway from a remote client a  
10            request to establish an outer connection;

11            receiving at said gateway over said outer connection a  
12            request to establish, and thereupon negotiating  
13            parameters including executing Internet key exchange  
14            (IKE) negotiations for establishing an agreed upon  
15            encryption algorithm and key generation for  
16            establishing, a secure inner connection;

17            responsive to outbound or inbound traffic on said inner  
18            connection, establishing links to said outer connection  
19            for communicating said traffic double nested on said  
20            outer connection to allow subsequent traffic to be  
21            correctly processed by said inner connection, then by  
22            said outer connection, at both ends of both connections  
23            thereby enabling outbound traffic between respective  
24            nodes selectively to flow inside said outer tunnel and  
25            not said inner tunnel, in said inner tunnel and said  
26            outer tunnel, and in neither tunnel.

END920000092US1

13 of 34

S/N 09/813,911

1        21. [Currently amended] A program storage device readable  
2        by a machine, tangibly embodying a program of instructions  
3        executable by a machine to perform method steps for  
4        operating a first one of a plurality of nodes in a  
5        communications network in which nested connections establish  
6        a tunnel within a tunnel including an inner connection and  
7        an outer connection having at least one coincident endpoint  
8        residing on a same node, comprising the steps of:

9                establishing at said first node a coincident endpoint  
10                for an outer connection and an inner connection with at  
11                least one second node in said network;

12                responsive to starting communication of traffic over  
13                said connections, establishing a link from said inner  
14                connection to said outer connection including executing  
15                Internet key exchange (IKE) negotiations for  
16                establishing an agreed upon encryption algorithm and  
17                key generation; and

18                responsive to said links, selectively encapsulating  
19                said traffic to said outer connection for transfer to  
20                said second node or decapsulating said traffic from  
21                said outer connection for receipt at said first node to

END920000092US1

14 of 34

S/N 09/813,911

22       allow subsequent traffic to be correctly processed by  
23       said inner connection, then by said outer connection,  
24       at both ends of both connections.

1       22. [Currently amended] A computer program product ~~or~~  
2       ~~computer program element~~ for nesting connections between a  
3       plurality of nodes in a communication network in which  
4       nested connections establish a tunnel within a tunnel  
5       including an inner connection and an outer connection having  
6       at least one coincident endpoint residing on a same node,  
7       ~~according to steps~~ said computer program product comprising:

8       a digital recording medium;

9       first program instructions for receiving at a first  
10       node on an outer connection a request from a second  
11       node to establish a coincident endpoint for nesting an  
12       inner connection within said outer connection;

13       second program instructions for negotiating over said  
14       outer connection parameters defining said inner  
15       connection resulting from Internet key exchange (IKE)  
16       negotiations for establishing an agreed upon encryption

END920000092US1

15 of 34

S/N 09/813,911

17        algorithm and key generation; and thereafter

18        third program instructions, responsive to communication  
19        occurring on said inner connection, at said first node  
20        linking to said outer connection for selectively  
21        receiving or sending said communication double nested  
22        on said outer connection to allow subsequent traffic to  
23        be correctly processed by said inner connection, then  
24        by said outer connection, at both ends of both  
25        connections; thereby enabling outbound traffic between  
26        respective nodes selectively to flow inside said outer  
27        tunnel and not said inner tunnel, in said inner tunnel  
28        and said outer tunnel, and in neither tunnel; and  
29        wherein

30        said first, second and third program instructions are  
31        recorded on said digital recording medium.

1        23. [Currently amended] A computer program product or  
2        ~~computer program element for perform method steps for~~  
3        operating an enterprise gateway node to a network in which  
4        nested connections establish a tunnel within a tunnel  
5        including an inner connection and an outer connection having

END920000092US1

16 of 34

S/N 09/813,911

6 at least one coincident endpoint residing on said gateway  
7 node, according to method steps said computer program  
8 product comprising:

9 a digital recording medium;

10 first program instructions for receiving at said  
11 gateway from a remote client a request to establish an  
12 outer connection;

13 second program instructions for receiving at said  
14 gateway over said outer connection a request to  
15 establish, and thereupon negotiating parameters  
16 establishing, a secure inner connection resulting from  
17 Internet key exchange (IKE) negotiations for  
18 establishing an agreed upon encryption algorithm and  
19 key generation;

20 third program instructions, responsive to outbound or  
21 inbound traffic on said inner connection, for  
22 establishing links to said outer connection for  
23 communicating said traffic double nested on said outer  
24 connection to allow subsequent traffic to be correctly  
25 processed by said inner connection, then by said outer

END920000092US1

17 of 34

S/N 09/813,911



26           connection, at both ends of both connections; and  
27           wherein

28           said first, second, and third program instructions are  
29           recorded on said digital recording medium.

1       24. [Currently amended] A computer program product ~~or~~  
2       ~~computer program element~~ for operating a first one of a  
3       plurality of nodes in a communications network in which  
4       nested connections establish a tunnel within a tunnel  
5       including an inner connection and an outer connection having  
6       at least one coincident endpoint residing on a same node  
7       ~~according to method steps~~ said computer program product  
8       comprising:

9           a magnetic recording medium;

10          first program instructions for establishing at said  
11          first node a coincident endpoint for an outer  
12          connection and an inner connection with at least one  
13          second node in said network;

14          second program instructions, responsive to starting

END920000092US1

18 of 34

S/N 09/813,911

15 communication of traffic over said connections, for  
16 executing Internet key exchange (IKE) negotiations for  
17 establishing an agreed upon encryption algorithm and  
18 key generation and establishing a link from said inner  
19 connection to said outer connection; and

20 third program instructions, responsive to said links,  
21 for selectively encapsulating said traffic to said  
22 outer connection for transfer to said second node or  
23 decapsulating said traffic from said outer connection  
24 for receipt at said first node to allow subsequent  
25 traffic to be correctly processed by said inner  
26 connection, then by said outer connection, at both ends  
27 of both connections; and wherein

28 said first, second, and third program instructions are  
29 recorded on said medium.